REMARKS

Claims 22-99 have been withdrawn from consideration. Claims 4, 15, and 16 have been previously cancelled. The claims remaining in the application are 1-3, 5-14, and 17-21.

The Examiner is thanked for his time and comments during the interview on May 10, 2006.

Rejection Under 35 U.S.C. § 103

The Office Action has rejected claims 1, 3, 6, 7, 9, 10, 18, and 19 under 35 U.S.C. 103(a) as being unpatentable over Dewald et al. (U.S. 6,771,335 B1) in view of Hewlett et al. (U.S. 5,812,303). This rejection is respectfully traversed.

In dealing with LcoS systems there are several idiosyncrasies that must be addressed. First, operation of the modulator is a combination of light illumination, bias voltage, and associated code value.

The LCD rotates the polarization state of the incident light. The degree of rotation is dependent on the wavelength of the light. For a given drive condition, red, blue, and green will see different degrees of polarization rotation. This directly corresponds to the amount of light that passes through the optical system.

In addition, the bias voltage determines the basic operating conditions. The bias voltage will set the maximum and the minimum amount of rotation and modulation. It is also important to note that the max and min correspond to the on/off ratio of the device. This bias voltage may take some amount of time to settle. Because conventional uses of such devices do not change the bias voltage, the settling time may last in excess of a frame. Furthermore, it may have to be completely discharged before a new voltage condition is initiated. This voltage is very difficult to introduce in a scrolling architecture. Bias voltage should not be confused with image data.

The fine-tuning or code value adjustment comes through a LUT or Look Up Table that maps address or voltage steps to output intensity. Each step in code value, which may be either a step in voltage or pulse width modulation duration, corresponds to a slight change in polarization rotation, which in turns

steps the output intensity of the light. These steps move between the minimum and maximum value previously determined by the bias voltage. The combination of the fine-tuning and the bias voltage map out a response curve FOR A GIVEN VBIAS. For example, a large spread may imply a S- shaped curve, or fine delineation at the lower and higher values of voltage. A small spread, may leave a steep linear curve. For a given application, this curve has to be fine tuned. For example, the slope of the curve may be less in regions where fine delination is not necessary such as at the foot of low intensity values. It may be steeper in the mid range, where small voltage steps can correspond to large intensity changes. The bit depth of an image is determined by the number of useful or discernable steps between the max and the min. The step voltage usually settled quickly. (The speed of the LC response is the limiting factor). All image data must be funneled through LUTs for a given bias voltage. This is particularly true in cases of medical imaging, this LUT funneling is critical because the required grey scale or bit depth is much higher than an entertainment image. For example, calcifications in a mammogram would be undetectable in a typical 8-bit color image.

The present invention uses a delicate balance of color composition, bias voltage, and code values to present a variety of display effects. Operator control of the hue requires balance of the entire system.

The primary reference in the present rejection is Dewald et al., U.S. Patent No. 6,771,325. The Dewald et al. reference was distinguished in detail in the Amendment and Remarks submitted September 20, 2005. It was pointed out that the Dewald et al. reference does not actually show "a beam of multicolored light." Dewald et al. shows <u>beams of single color light</u>, which scroll <u>sequentially</u> across a modulator. Thus, the modulator of Dewald et al. is exposed to three primary colors, however, one at a time. The Dewald et al. controller "provides appropriate image data for each portion of the modulator in synchronization with the sweep of the primary color bands across the modulator surface."

The present invention, however, claims a source having "a beam of multicolor light." Although the percentage of color or hue in each segment may vary in the present invention, the beam, after filtering, is multicolored and not a single primary color as in Dewald et al. <u>Each</u> segment of the filter is

multicolored. Time integrated perception of each segment allows detection of both calcium and tumors in, for example, soft tissue.

The Dewald et al. reference also fails to show "periodic attenuation." The independent claims in the present application, as amended, clearly shows that the use of periodic attenuation and includes changes in <u>both</u> color (or hue) and intensity.

Dewald's apparatus has many similarities to the present invention, but the goal and hence structure is quite different. Dewald needs to make the brightest display possible. For that reason, light recycling and usage are critical. Dewald is dependent on a scrolling architecture. The illumination system is timed to maximize the scrolling architecture. Because the goal is to maximize light with adequate bit depth, in depth voltage modulation is not necessary. Slight changes, which is all this architecture will allow, are adequate.

The Office Action states that Dewald et al. does not disclose "a single tone value of single hue" and suggests that Hewlett et al. teaches the missing part. The Office Action also states that it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Hewlett et al. into Dewald et al. to produce less artifacts. It is submitted, however, that the addition of Hewlett et al. to Dewald et al. would still fail to teach all the limitations of the present invention.

Hewlett merely incorporates regions of greater attenuation into the rotating filter, which is in direct contradiction to Dewald's purpose to maximize light. Hewlett is targeting systems that are pulse width modulated to increase the acceptable duration of the least significant bit. This is not synchronized with bias voltages, image data, or LUTs. Consequently, it does not significantly alter the net hue of the system as is defined in the current invention. It may increase the bit depth slightly, but cannot strongly affect the curve shape of the response. Furthermore, this approach is only applicable to PWM systems. Simply attenuating the beam does not assist when used with analog or voltage stepping algorithms. Finally, Hewlett's approach to creating a single color hue is to eliminate the color filter and simply attenuate a white light source. This cannot be combined with Dewald which relies on scrolling color from color filtered white light beam.

The Office Action has rejected claim 21 under 35 U.S.C. 103(a) as being unpatentable over Dewald et al. and Hewlett et al. as applied to claim 1 above, and further in view of Richards (U.S. 6,388,661 B1). This rejection is respectfully traversed.

The Office Action has rejected claim 2 under 35 U.S.C. 103(a) as being unpatentable over Dewald et al. and Hewlett et al. as applied to claim 1 above, and further in view of Tanaka et al. (U.S. 6,388,649 B1). This rejection is respectfully traversed.

The Office Action has rejected claims 5 and 20 under 35 U.S.C. 103(a) as being unpatentable over Dewald et al. and Hewlett et al. as applied to claim 1 above, and further in view of Dawson (U.S. Pub. No. 2002/0021832 A1). This rejection is respectfully traversed.

The Office Action has rejected claim 8 under 35 U.S.C. 103(a) as being unpatentable over Dewald et al. and Hewlett et al. as applied to claim 1 above, and further in view of Eaton (U.S. 4,876,608). This rejection is respectfully traversed.

The Office Action has rejected claim 11 under 35 U.S.C. 103(a) as being unpatentable over Dewald et al. and Hewlett et al. as applied to claim 1 above, and further in view of Berlin (U.S. 5,815,303). This rejection is respectfully traversed.

The Office Action has rejected claim 12 under 35 U.S.C. 103(a) as being unpatentable over Dewald et al. and Hewlett et al. as applied to claim 1 above, and further in view of Washburn (U.S. 5,585,691). This rejection is respectfully traversed.

The Office Action has rejected claim 13 under 35 U.S.C. 103(a) as being unpatentable over Washburn, Dewald et al. and Hewlett et al. as applied to claim 12 above, and further in view of Wang (U.S. 6,278,540). This rejection is respectfully traversed.

The Office Action has rejected claim 14 under 35 U.S.C. 103(a) as being unpatentable over Washburn, Dewald et al., and Hewlett et al. as applied to claim 12 above, and further in view of Wang.

The Office Action has rejected claim 17 under 35 U.S.C. 103(a) as being unpatentable over Dewald et al. and Hewlett et al., as applied to claim 1

above, and further in view of Patel et al. (U.S. 4,935,820). This rejection is respectfully traversed.

Dawson(variable filters), Tanaka(LCD), and Richards(LEDs) all describe individual components of a system. It is not the intention of the authors of the present invention to claim a single physical component but a complex system wherein all parts and their operation are carefully balanced.

Eaton mentions charge retention surfaces, but in conjunction with scanning and printing. An image retentive screen in a display application is quite different. The screen must hold a latent image in a manner that is observable by sight at an appropriate hue and bit depth to be of use in the present invention. As such, the screen too must be balance incorporated in the balance of the light, hue, and drive conditions of the system. This is a both a different object and a different use.

Berlin shows pixel by pixel adjustment of the light through the system by the modulator. Berlin does not show total system light control.

Wang shows circuit based control of the address or bias voltage of an electro-optic device. He does not show system control and synchronous of bias voltages to LUTs and voltage steps. Not all electro-optic devices behave the same.

Patel shows interchangeable filters but does not synchronize them with bias voltages, LUTs, and light intensity.

Washburn shows hue control in a CRT system whose drive conditions are quite different. Controlling hue through area bias voltage and LUTs is a different operation than gamma correction in a CRT system that controls beam arrest.

None of the references cited, either individually or in combination, show all the limitations of the claims of the present invention. The forced fit combination, in most cases, will not work. It is therefore respectfully requested that the rejections be withdrawn and the application allowed.

CONCLUSION

Dependent claims not specifically addressed add additional limitations to the independent claims, which have been distinguished from the prior art and are therefore also patentable.

In conclusion, none of the prior art cited by the Office Action discloses the limitations of the claims of the present invention, either individually or in combination. Therefore, it is believed that the claims are allowable.

If the Examiner is of the opinion that additional modifications to the claims are necessary to place the application in condition for allowance, he is invited to contact Applicant's attorney at the number listed below for a telephone interview and Examiner's amendment.

Respectfully submitted,

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If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.

Enclosure: Extension of Time - 3 months